

# Operation Analytics and Investigating Metric Spike

Name: Asima Siddiqua

## **Case Study 1: operation analytics**

### **Project Description:**

The project's main objective is to discover areas for improvement by analyzing a company's employment review processes using operational analytics. I analyzed job data from November 2020 using SQL as a Data Analyst to find trends, throughput, and language distribution. The investigation focused on peak review periods, efficiency indicators, and language preferences in an effort to shed light on work performance. Decision-making procedures are enhanced and strategies for operation are optimized with the aid of this information.

### **Approach:**

I took the following actions to carry out the analysis:

- **Data Preparation:** Imported the job\_data CSV file into the job\_data table after creating a MySQL database.
- **Developing SQL Query:** Created SQL queries to handle every task listed in the case study. This includes language share, throughput analysis, duplicate row identification, and the computation of jobs examined over time.
- **Data analysis:** Ran the SQL queries to draw conclusions from the information. Every query sought to provide a solution to a particular query and draw significant inferences from job review metrics and patterns.
- **Interpretation of Insights:** Examined the outcomes of the SQL queries and summarized important conclusions that might guide changes to operations.

### **Tech-Stack Used:**

- **MySQL Workbench** was used: This database administration tool was used to create and manage tables as well as databases. Additionally, it made it possible to run SQL queries for data analysis.
- **CSV Files:** To enable analysis in MySQL, data was imported from CSV files including job data.

### **Insights:**

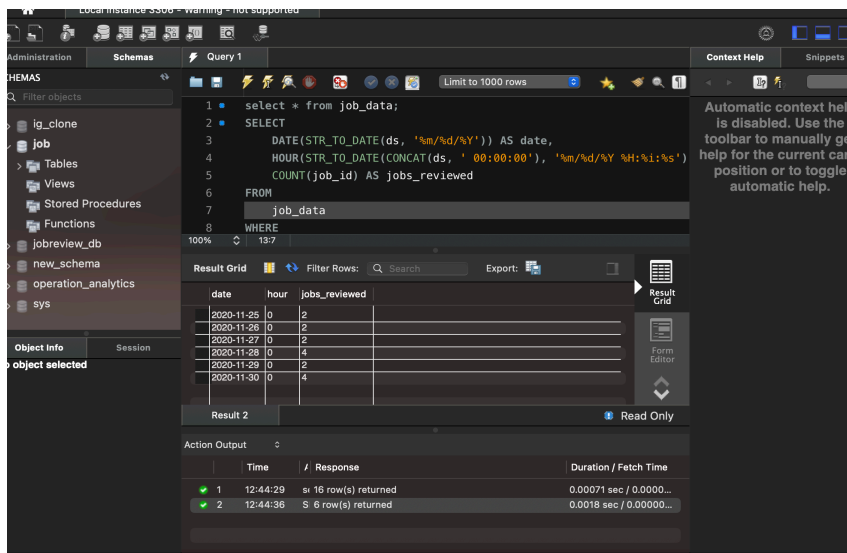
The analysis produced a number of insightful findings:

- **Jobs Reviewed Over Time:** Peak review hours were identified, recommending ideal personnel levels during busy periods.
- **Throughput Analysis:** By separating out typical variations from real performance difficulties, the 7-day picking average of throughput gave a more solid picture of job review efficiency.
- **Language Share Analysis:** Knowledge about the preferred languages used by job evaluators helped identify possible areas for specialized training or the distribution of resources.
- **Duplicate Rows Detection:** This approach found duplicate entries that can distort the outcomes of analysis, emphasizing the necessity of data cleaning and validation procedures.

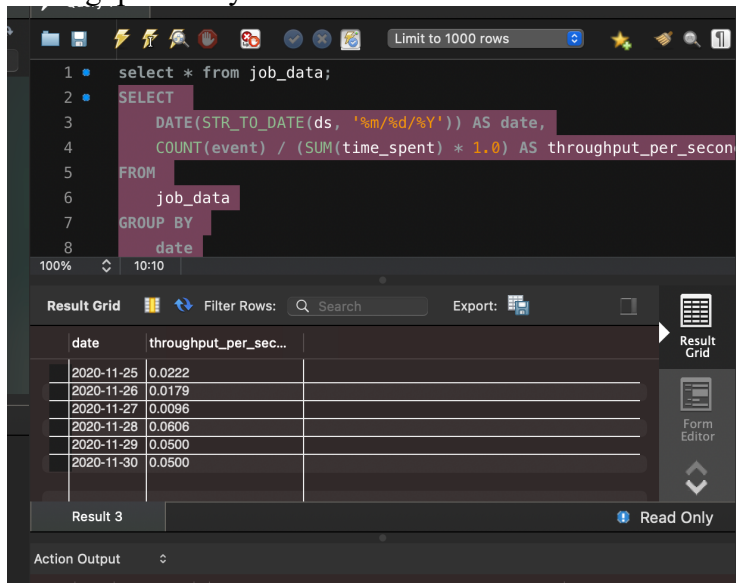
### **Result:**

I was able to effectively analyze job data through this project, finding trends and insights that are essential for enhancing operational efficiency. The results help to clarify the employment evaluation procedure and enable the business to make informed decisions. This training has strengthened my SQL expertise and analytical skills, equipping me for future challenges in data analysis and operational optimization.

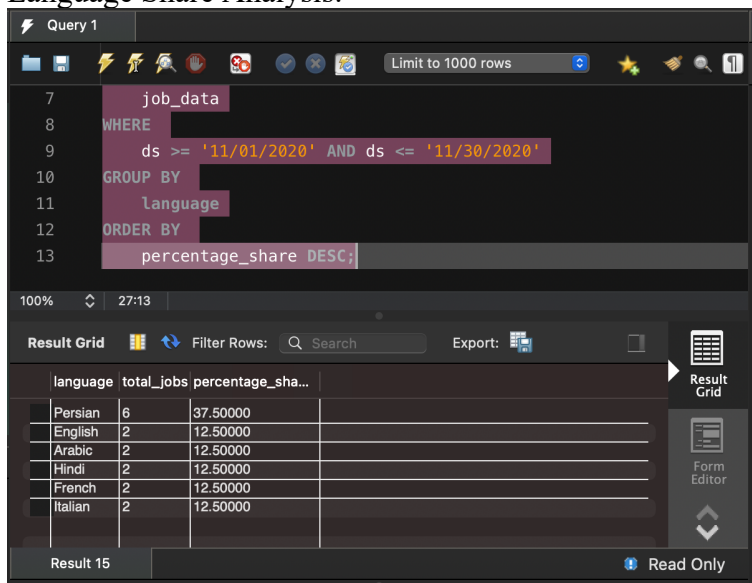
- **Jobs Reviewed Over Time:**



- Throughput Analysis:



- Language Share Analysis:



- Duplicate Rows Detection:

```

1 • select * from job_data;
2 • SELECT
3 •     ds, job_id, actor_id, event, language, time_spent, org,
4 •     COUNT(*) AS count
5 • FROM
6 •     job_data
7 • GROUP BY
8 •     ds, job_id, actor_id, event, language, time_spent, org

```

ds	job_id	actor_id	event	language	time_spent	org
11/30/2020	22	1006	transfer	Arabic	25	B
11/29/2020	23	1003	decision	Persian	20	C
11/28/2020	23	1005	transfer	Persian	22	D
11/28/2020	25	1002	decision	Hindi	11	B
11/27/2020	11	1007	decision	French	104	D
11/26/2020	23	1004	skip	Persian	56	A
11/25/2020	20	1003	transfer	Italian	45	C

Result 16 Read Only

## Case study 2: Investigating Metric Spike

### Project Description:

In order to better understand and enhance user growth and retention patterns within a digital product ecosystem, the project looks into user engagement measures. In my role as Lead Data Analyst, I looked for patterns and high points in user activity by analysing data from user interactions, events, and email correspondence over a predetermined time frame. Finding insights that would improve user experience, guide marketing efforts, and eventually increase user retention was the aim.

### Approach:

I used the following methodical procedure to carry out the analysis:

- **Preparing the Data:** I made a MySQL database and imported the pertinent CSV files into the users, events, and email events tables.
- **SQL Query Development:** I developed SQL queries that addressed certain issues concerning user engagement, growth, retention, and email exchanges for every analysis assignment.
- **Execution of Queries:** I ran the SQL queries to extract information from the datasets, making sure that each was accurate and efficient.
- **Analysis of the Results:** Following the execution of the queries, I examined the data to obtain insightful and significant interpretations, which I then methodically recorded.
- **Report Compilation:** In order to improve clarity, I incorporated visuals where appropriate into a structured report style that included the findings, insights, and interpretations..

### Tech-Stack Used:

- **MySQL Workbench** was used: This database administration tool was used to create and manage tables as well as databases. Additionally, it made it possible to run SQL queries for data analysis.
- **CSV Files:** To enable analysis in MySQL, data was imported from CSV files including job data.

### Insights:

During the analysis, I discovered a few important things:

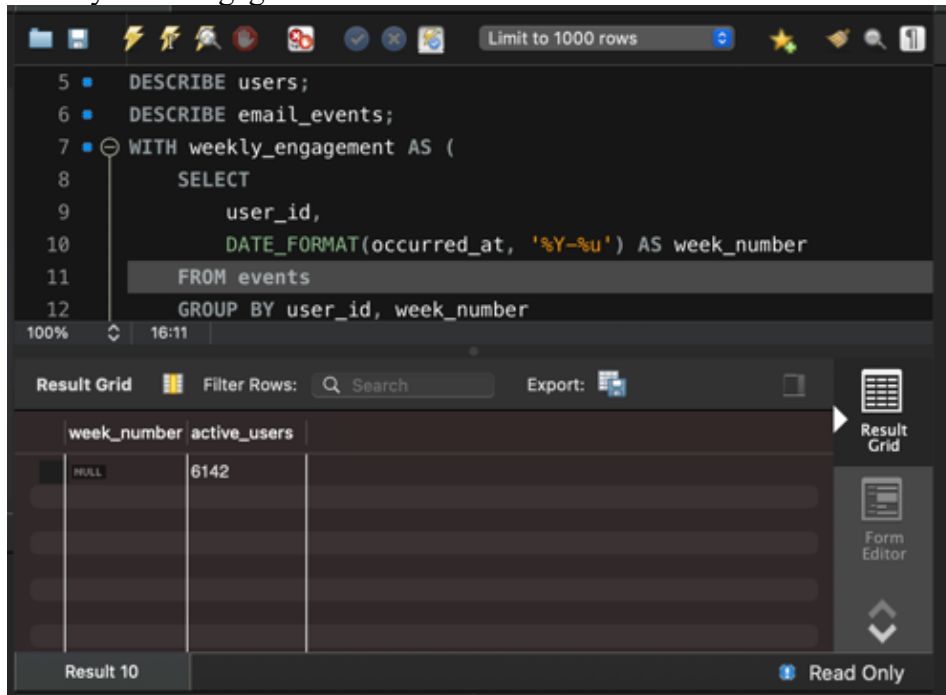
- **User Engagement Trends:** According to engagement data, certain promotional times saw a peak in user activity, which suggests that focused marketing campaigns had an impact.
- **Growth Patterns:** Information on user growth showed that periods of high usage frequently corresponded with new releases of products or promotional campaigns, indicating successful methods of drawing in new customers.
- **Challenges with Retention:** An examination of user retention revealed a decline in some cohorts, suggesting possible problems with the onboarding procedure or user experience that need attention.
- **Device Usage:** The research showed variations in user involvement among different kinds of devices, pointing to potential areas for UI improvement for devices that aren't functioning up to par.

- Email Engagement: Personalized content greatly enhanced user engagements, according to email campaign engagement metrics, indicating the need for customized communication tactics.

### Result:

I accomplished this assignment by doing a thorough study of user engagement and growth data, which gave me useful information for making strategic decisions inside the company. The results enhance our understanding of user behaviour and enable more focused enhancements to user experience, marketing tactics, and retention programs. My analytical abilities and SQL competence have greatly improved as a result of this assignment, setting me up for future data analysis difficulties.

- Weekly User Engagement



The screenshot shows a SQL IDE with a query editor and a result grid. The query is as follows:

```

5 • DESCRIBE users;
6 • DESCRIBE email_events;
7 • WITH weekly_engagement AS (
8     SELECT
9         user_id,
10        DATE_FORMAT(occurred_at, '%Y-%u') AS week_number
11    FROM events
12    GROUP BY user_id, week_number

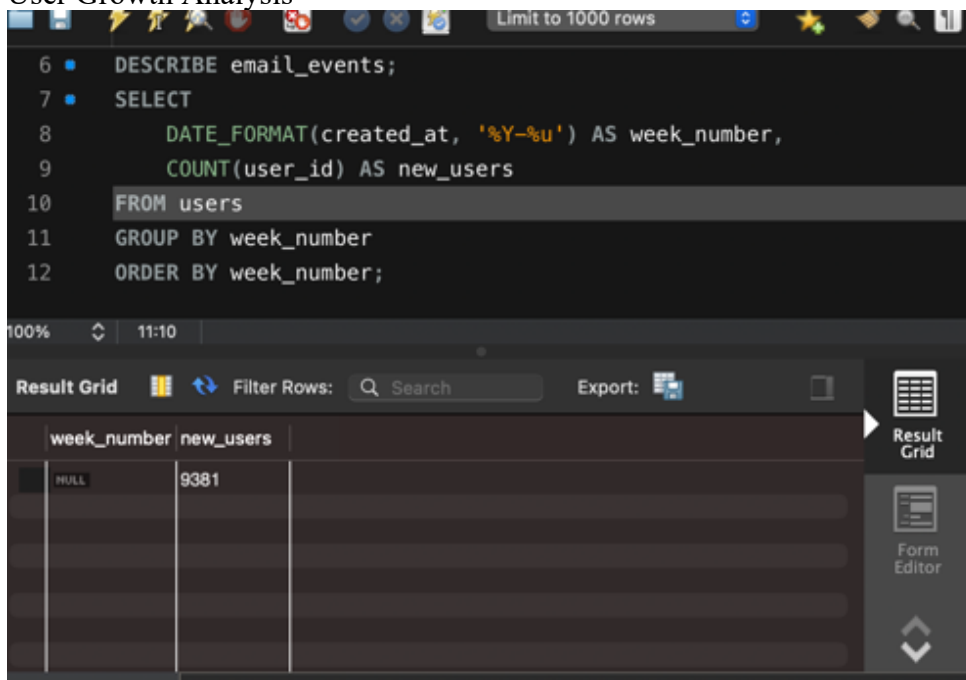
```

The result grid displays the following data:

week_number	active_users
NULL	6142

The interface includes a toolbar at the top with icons for file operations, a search bar, and a 'Limit to 1000 rows' dropdown. The bottom of the window shows 'Result 10' and a 'Read Only' status.

- User Growth Analysis



The screenshot shows a SQL IDE with a query editor and a result grid. The query is as follows:

```

6 • DESCRIBE email_events;
7 • SELECT
8     DATE_FORMAT(created_at, '%Y-%u') AS week_number,
9     COUNT(user_id) AS new_users
10 FROM users
11 GROUP BY week_number
12 ORDER BY week_number;

```

The result grid displays the following data:

week_number	new_users
NULL	9381

The interface includes a toolbar at the top with icons for file operations, a search bar, and a 'Limit to 1000 rows' dropdown. The bottom of the window shows 'Result 10' and a 'Read Only' status.

- Weekly Retention Analysis

```
15 cohort.signup_week,
16 engagement.active_week,
17 COUNT(DISTINCT engagement.user_id) AS retained_users
18 FROM cohort
19 JOIN engagement ON cohort.user_id = engagement.user_id
20 GROUP BY cohort.signup_week, engagement.active_week
21 ORDER BY cohort.signup_week, engagement.active_week;
```

100% 53:21

Result Grid Filter Rows: Search Export: Result Grid Form Editor

signup_week	active_week	retained_users
NULL	NULL	6142

Result 13 Read Only

Action Output

	Time	At	Response	Duration / Fetch
✓	56	14:35:16	... 1 row(s) returned	0.208 sec / 0.00
✓	57	14:36:19	... 1 row(s) returned	0.020 sec / 0.00
✓	58	14:36:58	... 1 row(s) returned	0.019 sec / 0.00
✓	59	14:38:06	... 1 row(s) returned	0.218 sec / 0.00

- Weekly Engagement Per Device

Limit to 1000 rows

```
9 SELECT
10 week_number,
11 device,
12 COUNT(DISTINCT user_id) AS active_users
13 FROM weekly_engagement_device
14 GROUP BY week_number, device
15 ORDER BY week_number, device;
```

100% 30:13

Result Grid Filter Rows: Search Export: Result Grid Form Editor

week_number	device	active_users
NULL	macbook pro	1952
NULL	nexus 10	273
NULL	nexus 5	621
NULL	nexus 7	355
NULL	nokia lumia 635	211
NULL	samsung galaxy tablet	107
NULL	samsung galaxy note	119
NULL	samsung galaxy s4	803
NULL	windows surface	182

Result 14 Read Only

Action Output

	Time	At	Response	Duration / Fetch
✓	57	14:36:19	... 1 row(s) returned	0.020 sec / 0.00
✓	58	14:36:58	... 1 row(s) returned	0.019 sec / 0.00
✓	59	14:38:06	... 1 row(s) returned	0.218 sec / 0.00
✓	60	14:38:59	... 26 row(s) returned	0.294 sec / 0.00

- Email Engagement Analysis

Limit to 1000 rows

1 SELECT  
2 DATE\_FORMAT(occurred\_at, '%Y-%u') AS week\_number,  
3 action,  
4 COUNT(DISTINCT user\_id) AS engaged\_users  
5 FROM email\_events  
6 GROUP BY week\_number, action  
7 ORDER BY week\_number, action;

100% 30:7

Result Grid Filter Rows: Search Export: Form Editor

week_number	action	engaged_users
NULL	email_clickthrough	5277
NULL	email_open	5927
NULL	sent_reengagement_email	3653
NULL	sent_weekly_digest	4111

Result 15 Read Only

Action Output

	Time	Ai	Response	Duration / Fetch
✓ 58	14:36:58	...	1 row(s) returned	0.019 sec / 0.00
✓ 59	14:38:06	...	1 row(s) returned	0.218 sec / 0.00
✓ 60	14:38:59	...	26 row(s) returned	0.294 sec / 0.00
✓ 61	14:39:59	...	4 row(s) returned	0.150 sec / 0.00